CLAIMS

1. Method for sending information data between at least two transceivers in a telecommunication system, wherein the information data is transmitted from the sending side of a transceiver to the receiving side of one or more other transceivers in form of digital signals having a given sampling frequency, which signals are played out at said receiving side in a controlled way, comprising the following steps:
   a) estimation of the sender's sampling frequency at said sending side,
   b) transmitting the estimation to said receiving side, and
   c) controlling the play-out of the received data at said receiving side by means of the sampling rate estimated at said sending side to avoid delays in the presentation.

2. Method of claim 1, c h a r a c t e r i z e d in that the information data is sent in form of packet data frames.

3. Method of claim 2, c h a r a c t e r i z e d in that the packet data frames are audio frames.

4. Method of ~~any of~~ claims ~~1 — 3~~, c h a r a c t e r i z e d in that in step c), the controlling of the play-out of received data at said receiving side by means of the sampling rate estimated at said sending side is carried out by estimation of the receiver's sampling frequency at said receiving side and performing a compensation of the difference in said estimated sampling frequencies at said sending and receiving sides by a sample rate conversion method.

5. Method of claim 4, c h a r a c t e r i z e d in that in said conversion method the amount of samples in the packet frames are changed.

6. Method of ~~any of claims 1 — 3~~, c h a r a c t e r i z e d in that in step c), the controlling of the play-out of received data at said receiving side by means

of the sampling rate estimated at said sending side is carried out by synchronizing the receiver's sampling rate to the sender's sampling rate.

7. Method of claim 6, c h a r a c t e r i z e d in that the synchronization is carried out by means of a PLL.

8. Method of ~~any of claims 1 - 7~~ claim 1, c h a r a c t e r i z e d in that it is performed in a two-way communication between at least two transceivers in such a way that

an estimation of the sender's sampling frequency is performed at the sending side of a first transceiver,

the estimation is transmitted to the receiving side of a second transceiver,

the playing out of the received data is controlled at said receiving side of said second transceiver by means of the sampling rate estimated at said sending side of said first transceiver,

the estimation of the sampling rate estimated at said sending side of the first transceiver is used by said second transceiver in the transmitting of messages from the second transceiver to the first transceiver in the communication between said transceivers.

9. Method of ~~any of claims 1 - 7~~ claim, c h a r a c t e r i z e d in that it is performed in a two-way communication between at least two transceivers in such a way that

an estimation of the sender's sampling frequency is performed at the sending side of a first transceiver,

the estimation is transmitted to the receiving side of a second transceiver,

the playing out of the received data is controlled at said receiving side of said second transceiver by means of the sampling rate estimated at said sending side of said first transceiver,

an estimation of the sampling frequency of the sending side of said second transceiver is performed at said sending side of said second transceiver,

the estimation of the sampling frequency of said sending side of said second transceiver is transmitted to the receiving side of said first tranceiver,

and the play-out of the received data is controlled at said receiving side of said first transceiver by means of the sampling rate estimated at said sending side of said second transceiver.

10. Method of ~~any of claims 1 - 9~~, characterized in that said transmitting in step b) is done at call setup so that received data can immediately be used at the receiving side to avoid initial delays in the compensation before the presentation.

11. Method of ~~any of claims 1 - 9~~, characterized in that said transmitting in step b) is done during the session.

12. Method of ~~any of claims 1 - 11~~, characterized in that said estimation is either or both incorporated in regular reports within standard control packets and transmitted as separate reports within own packets.

13. Method of ~~any of claims 1 - 12~~, characterized in that the estimation of the sampling rate in step a) is carried out in form of a calculation based on the time measured between two events and the number of samples that has been sampled between them.

14. Method of claim 13, characterized in that said time is measured between two time synchronization events.

15. Method of claim 14, characterized in that in the time synchronization event, a host clock is synchronized to an external clock.

16. Method of claim 13, characterized in that said time is measured between two frame delivers of packet data.

17. Method of claim 13, c h a r a c t e r i z e d in that a ticking central processing unit (CPU) clock is used to measure the time between two events by

reading the time value of the CPU clock at two different times,

estimating the number of ticks between the time values, and

calculating the actual time between the events by means of the number of ticks per time unit.

18. Method of claim 17, c h a r a c t e r i z e d in that the number of ticks per second is estimated by means of a long term stable time reference and the CPU clock.

19. Method of claim 18, c h a r a c t e r i z e d in that the long term stable time reference is a synchronized host clock.

20. Method of claim 17, c h a r a c t e r i z e d in that the number of ticks per second is calculated as a function of the time difference between two CPU clock values at specific events and the time difference between two reference time values at the same events.

21. Method of claim 17, c h a r a c t e r i z e d in that the number of ticks per second is calculated as a moving average of the last few estimations.

22. Method of ~~any of claims 1 - 21,~~ claim 1 c h a r a c t e r i z e d in that the estimation in step a) is carried out at a time synchronization event.

23. Method of ~~any of claims 1 - 15~~, claim 1 c h a r a c t e r i z e d in that the status of the soundboard buffer is polled before estimation, continuously or in connection with specific events.

24. Method of claim 23, c h a r a c t e r i z e d in that the estimation in step a) is carried out by means of the time difference between time values at two

synchronization events and the time difference between two reference time values at the same events.

25. Method of ~~any of claims 1 - 24~~ claim 1, characterized in that the estimation in step a) is carried out by means of a moving average of the last few estimations.

26. Method of ~~any of claims 1 - 25~~ claim 1, characterized in that the estimation process is performed continuously.

27. Arrangement in a telecommunication system comprising at least two transceivers, wherein the information data is transmitted from the sending side of a transceiver to the receiving side of one or more other transceivers in form of digital signals having a given sampling frequency, which signals are played out at the receiving side in a controlled way, the arrangement comprising:

a) means for estimation of the sender's sampling frequency at the sending side of a transceiver in the system,

b) means for transmitting the estimation to the receiving side of another transceiver in the system, and

c) means for controlling the play-out of the received data at said receiving side by means of the sampling rate estimated at said sending side to avoid delays in the presentation.

28. Arrangement of claim 27, characterized in that said means for controlling the play-out of the received data at the receiving side comprises

means for estimation of the receiver's sampling frequency at said recieving side and

means for performing a compensation of the difference in said estimated sampling frequencies at the sending and receiving sides by means of a sample rate conversion method.

29. Arrangement of claim 28, c h a r a c t e r i z e d in that the means for estimation of the sampling rate at the sending side comprises a Calculation Unit (CCU) for calculation the CPU ticks per seconds, and a Sampling Frequency Estimation Unit (SEU).

30. Arrangement of claim 27 ~~o 28~~, c h a r a c t e r i z e d in that the means for transmitting the estimation to the receiving side comprises a Sampling Frequency Distribution Unit (SDU).

31. Arrangement of claim 30, c h a r a c t e r i z e d in that the Sampling Frequency Distribution Unit (SDU) is the interface between the transfer protocols and said estimation units (CCU, SEU).

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